Biråstoff som bidrag for et bærekraftig fiskefôr

Kjell Måsøval
BioMar AS

Active

We have tools and methods that enable active improvement and sustainability optimization of feeds.

Additional

BioSustain demands supplier standards on general and specific raw material production.

Basic

BioMar companies use certified management systems with improvement programs and follow guidelines on social responsibility.

Legal compliance

National, regional and international laws and regulation founds all BioMar Activities.

ISO 9001

An ISO 9001 certificate proves that BioMar`s quality management system is certified under the standard for quality management and is found to be in line with it. The certification is performed by an independent third party, so that our customers can trust that we have implemented the necessary internal processes to meet their obligations.

Read more

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ISO 14001

An ISO 14001 certificate proves that BioMar`s environmental management system has been measured against a standard for good environmental management and comply with it. Because the certification is conducted by an independent third party, our customers can feel confident that we are actively reducing the environmental impact of the company, products and services.

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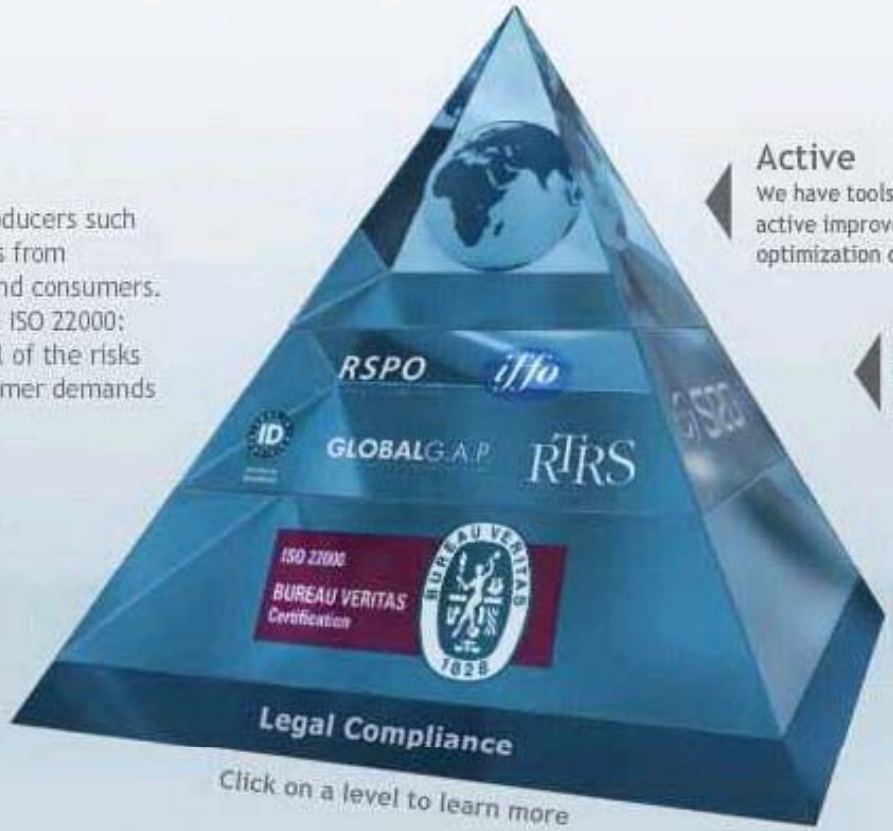
ISO 22000

When it comes to security, food producers such as BioMar encounter great demands from regulatory authorities, customers and consumers. A certification by the food standard ISO 22000: 2005 proves that BioMar is in control of the risks in the production, and meets customer demands for food safety.

Read more



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Social Responsibility

BioMar is committed to ensure high standards of social responsibility. Part of our role as a multinational company sourcing raw materials in the global market is to ensure our suppliers meet the standards outlined in our Supplier Code of Conduct.

Read more

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RSPO

In response to the urgent and pressing global call for sustainably produced palm oil, the Roundtable on Sustainable Palm Oil (RSPO) was formed in 2004 with the objective of promoting the growth and use of sustainable oil palm products through credible global standards and engagement of stakeholders.

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IFFO

IFFO stands for the International Fishmeal and Fish oil Organisation and is the international non-profit organisation which represents fishmeal and fish oil producers and related trades throughout the world. IFFO is a globally respected Non-Governmental Organisation.

Read more

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GLOBAL G.A.P

GlobalGAP (former EurepGAP) is a common standard for farm management practice created in the late 1990s by several European supermarket chains and their major suppliers. GAP is an acronym for Good Agricultural Practices.

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RTRS

The Round Table on Responsible Soy Association is an international multi-stakeholder initiative that brings together those concerned with the impacts of the soy economy.

Read more

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ProTerra

The ProTerra standard, which was developed for the Basel Criteria for Responsible Soy Production, complies with and even cover a wider scope than the Basel Criteria* with respect to social aspects and legal requirements.

Read more

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LCA

The goal of LCA (Life cycle assessment) is to compare the full range of environmental and social damages assignable to products and services, to be able to choose the least burdensome one.

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Ei/BSi

Based on LCA of all our raw materials we have developed an Eco index (Ei) on every raw material by comparing the total ecological impact of each raw material to a fixed reference value.

Read more

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TCO

Total cost of ownership (TCO) is a financial estimate. Its purpose is to help consumers and enterprise managers determine direct and indirect costs of a product or system.

Read more

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EEA

The purpose of EEA (Eco-Efficiency Analysis) is to harmonize economy and ecology. Eco-Efficiency Analysis is applied in order to use as few materials and energy as possible in producing our products and to keep emissions as low as possible.

Read more

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ISO 14040 series

The Eco-Efficiency Analysis methodology is based on DIN EN ISO 14040 and 14044 for ecological evaluations. The method for Eco-Efficiency Analysis is certified by the German TÜV and in US by NSF International. The methodology is also third party validated by ETH in Switzerland.

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Sustainability formulation

- The BioSustain index

- Eco index of raw materials - Ei
  - ✓ Compares and scores every single raw material on relative ecological load (compared to wheat)
  - ✓ Indicates environmental impact of raw materials (RMs)
- BioSustain index of feeds - BSi
  - ✓ Total sum of weighted Eco indexes in a product
    - Due to inclusion levels of RMs (RM x Ei)
  - ✓ Enables feed formulation on relative environmental load
    - May indicate high or low eco-efficient score when used in EEM
  - ✓ Basically for internal use
- Eco-Efficiency Analysis Manager Online - EEM
  - ✓ Web client for comparing product recipes on eco-efficiency
  - ✓ Breakdown of feeds to uncover RM energy consumption, RM GWP, etc.
  - ✓ For internal and external use!

Eco-Efficiency Analysis Manager

- Online portal

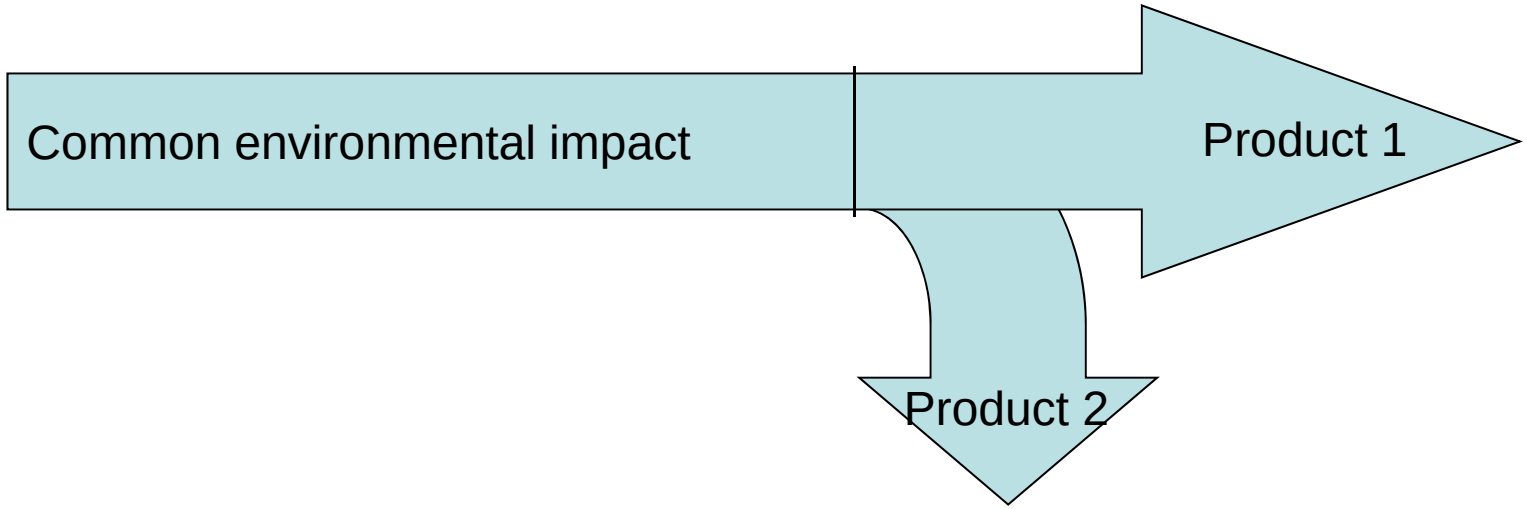
- Internet portal for breakdown and analysis of raw materials and recipes
  - ✓ Eco-profiles of RMs and recipes, specific breakdown e.g.
    - **GWP emissions**
    - C-track (carbon footprint)
  - ✓ Eco-efficiency of feeds
    - **Eco-efficiency portfolio**, costs included
- Eco-profiles of all RMs allow a complete breakdown of fish feeding history
- Recipes can be directly compared, both post and pre feeding

Use of by-products

-example (fishmeal/fish oil made from trimmings or silage)

Product	CPK 75	CPK 200	CPK 500	CPK 1000	CPK 2000	CPK 3500
Substitution of fishmeal (%)	12	19	30	50	50	50
Substitution of total oil (%)	50	50	64	50	45	51

Allocation of environmental impact between main product and by-product



$$\frac{\text{Price2} * \text{Volume2}}{\text{Price1} * \text{Volume1} + \text{Price2} * \text{Volume2}} * \text{Common environmental impact}$$

BIOSUSTAIN

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Eco-Efficiency Analysis Manager Online

Biomar Fish Feed 2009

Logged in as
biomar1
Logout

customer benefit: feed production for	1 kg fish	sustainable fishing	on
last developmental stage considered	6	sustainable soy	on
fish mortality rate	0,0% %	FIFO based on	unallocated fish
Zoom factor	1		

About the Manager

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
name	CPK trad	CPK bi				
enabled	on	on	off	off	off	off

view chart | export values | save current values | restore latest saved values | restore default values

^ top

feed stage 1

fish weight

starting weight	0,075 kg
final weight	0,2 kg
site	Myre / Myre

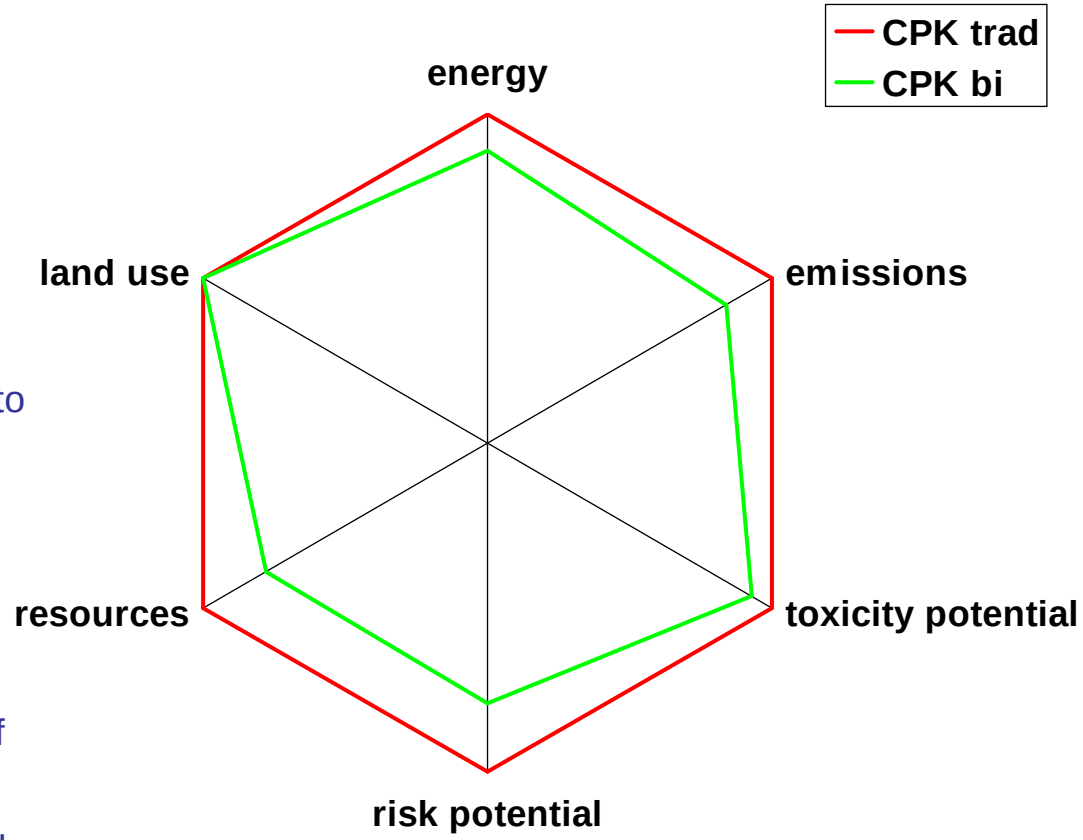
BIOMAR SUSTAINABLE DEVELOPMENT

Charts

1. **Environmental fingerprint**
2. **Eco-efficiency plot**
3. Costs
4. **Energy use**
5. Resource consumption
6. **Global warming potential**
   - ✓ Carbon footprint
7. Photochemical ozone creation potential
8. Acidification potential
9. Water emissions
10. Solid wastes
11. Land use
12. Risk potential
13. Toxicity potential
14. **Fish in-fish out**
    - ✓ No significance for LCA

1. Environmental fingerprint

- Environmental impact expressed by scores in relation to:
  - ✓ Energy consumption
  - ✓ Emissions
    - Air and water and solid waste
  - ✓ Toxicity potential
    - R-phrases of substances, LCA
    - Nature of special risks attributed to dangerous substances and preparations
  - ✓ Risks potential
    - Occupational accidents
  - ✓ Resources
    - Raw material consumption
    - Based on life span calculations of more than 200 natural resources
    - Available resources and rate of consumption are used to weight the amounts used
  - ✓ Land use



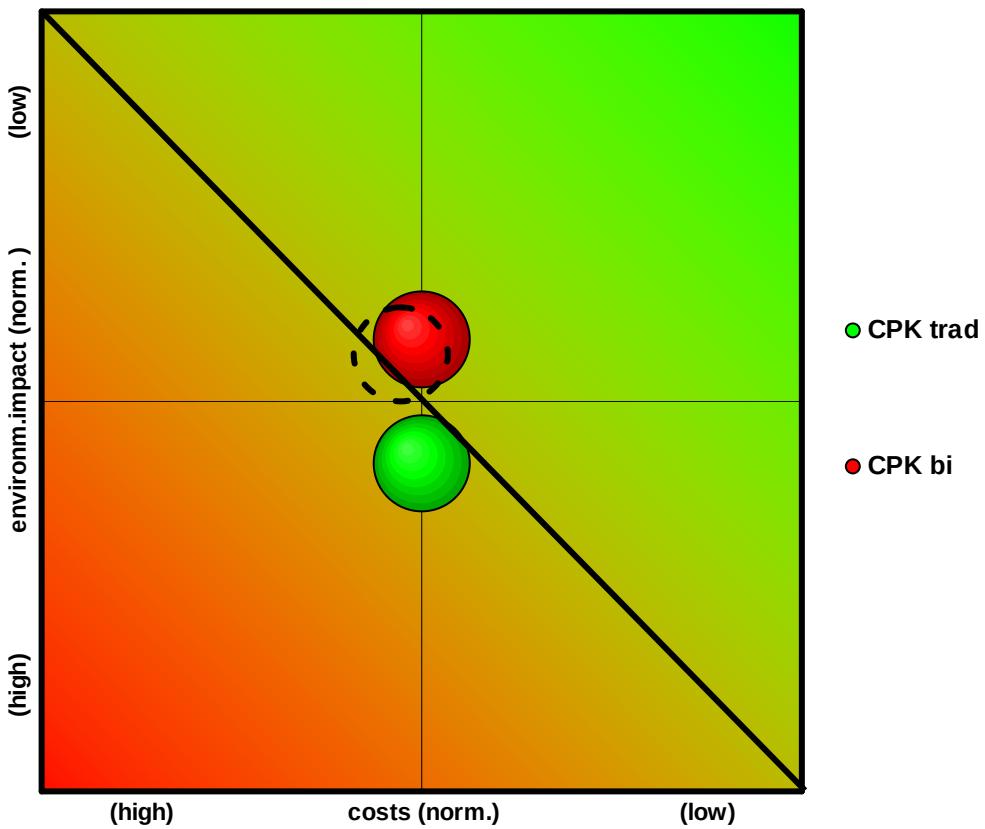
2. Determination of the Overall Environmental Impact - Weighting by subjective and objective factor

Calculation Factor = Geometric mean of Relevance Factor and Societal Factor

20%	**Energy consumption**			
20%	**Raw material consumption** (incl. fish)			
10%	**Area use**			
20%	**Emissions**	Air emissions 50%	Global Warming Potential (incl. N_2O from agriculture rape seed)	50%
		Water emissions 35%	Ozone destruction	20%
20%	**Toxicity potential** (incl. dioxin in fish oil)		Photochemical ozone creation potential	20%
10%	**Risk potential**	Waste 15%	Acidification potential	10%

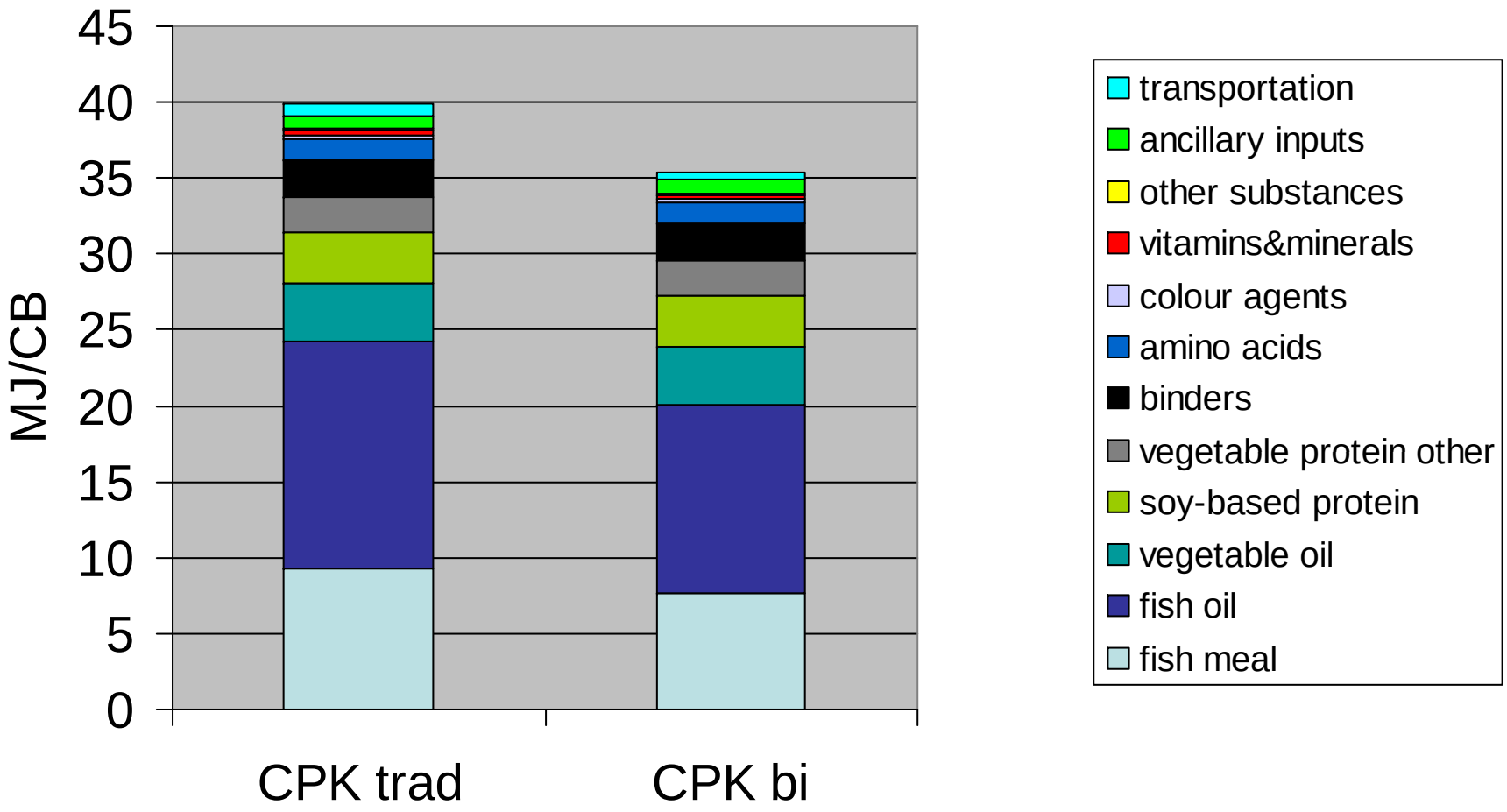
2. Eco-Efficiency plot

- Impact of ecology and cost



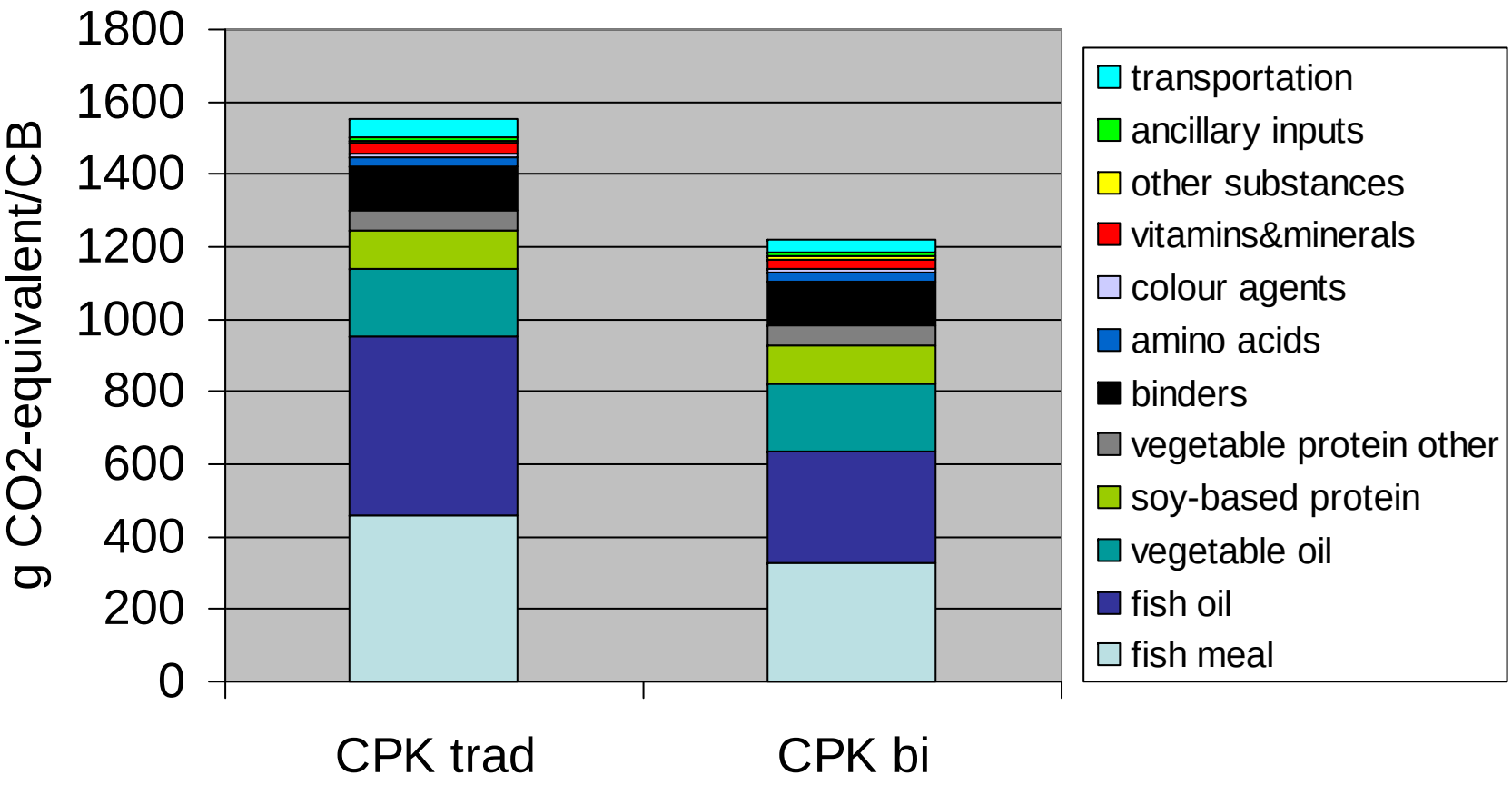
- Eco-efficiency of a product relatively to other products
  - ✓ Environ. impact
  - ✓ Costs
- Strategic tool
  - ✓ To detect and exploit potential ecological and economic improvements
- Compare differences in sustainability

4. Energy use


45
40
35
30
25
20
15
10
5
0
MJ/CB
CPK trad
CPK bi
transportation
ancillary inputs
other substances
vitamins&minerals
colour agents
amino acids
binders
vegetable protein other
soy-based protein
vegetable oil
fish oil
fish meal

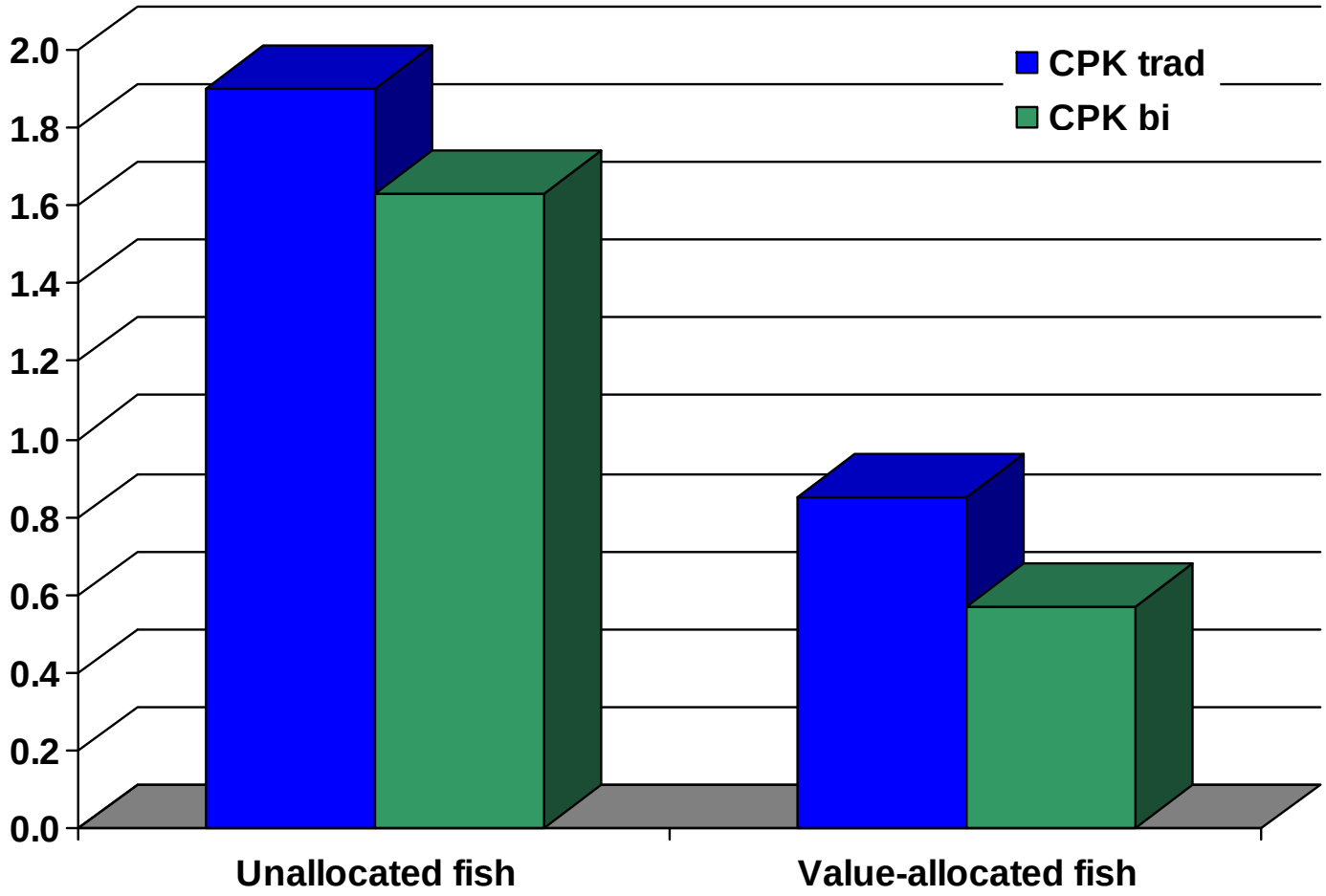
6. Global Warming Potential (GWP)

- Expressed as CO_2-Equivalents



14. Fish in-fish out ratio

- No significance for LCA



Conclusions

- Methodology in place to develop more sustainable fish feeds
- Use of by-products (e.g. trimmings and silage for fishmeal and fish oil production) reduces the environmental effect of fish feed production
  - ✓ More sustainable